In the Claims

This listing of claims will replace all prior versions and listings of claims in the application:

1 1. A method of synthesizing music in a digital system,
2 comprising the steps of:
3 accessing a digital analysis waveform having a first duration,
4 a first pitch, a first attack portion and a first decay portion;
5 determining a second duration and a second pitch for a
6 synthesis waveform;
7 computing first timing marks for the analysis waveform such
8 that the first timing marks correspond to periodicity of the
9 analysis waveform;
10 computing second timing marks for the synthesis waveform such
11 that the second timing marks correspond to periodicity of the
12 synthesis waveform; and
13 calculating samples for each period of the synthesis waveform
14 defined by adjacent second timing marks using samples selected from
15 a corresponding period of the analysis waveform defined by adjacent
16 first timing marks to form the synthesis waveform having the second
17 pitch, the second duration, a second attack portion and a second
18 decay portion; and
19 wherein the step of calculating samples to form the synthesis
20 waveform includes
21 determining whether the duration of the synthesis
22 waveform is greater than the duration of the analysis
23 waveform,
24 if the duration of the synthesis waveform is greater than
25 the duration of the analysis waveform synthesizing the second
26 attack portion by pitch modification of the analysis waveform
27 and the synthesizing the second decay portion by pitch
28 modification and duration extension, and

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29   if the duration of the synthesis waveform is not greater
30   than the duration of the analysis waveform synthesizing both
31   the second attack portion and the second decay portion by
32   pitch modification.

2.   (Canceled)

1   3.   (Currently Amended) ~~The~~ A method of ~~Claim 2~~ synthesizing
2 music in a digital system, comprising the steps of:
3   accessing a digital analysis waveform having a first duration,
4 a first pitch, a first attack portion and a first decay portion;
5   determining a second duration and a second pitch for a
6 synthesis waveform;
7   computing first timing marks for the analysis waveform such
8 that the first timing marks correspond to periodicity of the
9 analysis waveform;
10   computing second timing marks for the synthesis waveform such
11 that the second timing marks correspond to periodicity of the
12 synthesis waveform; and
13   calculating samples for each period of the synthesis waveform
14 defined by adjacent second timing marks using samples selected from
15 a corresponding period of the analysis waveform defined by adjacent
16 first timing marks to form the synthesis waveform having the second
17 pitch, the second duration, a second attack portion and a second
18 decay portion, step of calculating samples for each period further
19 comprising the steps of:
20   calculating a set of samples for a period m using a first
21   cosinous window,
22   calculating a set of samples for a period $m-1$ using a
23   second cosinous window,
24   combining the set of samples for period m and the set of
25   samples for period $m-1$ using a weighting function, and

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26   wherein the first cosinous window operates on two
27   adjacent periods and the second cosinous window operates on
28   two adjacent periods shifted by one period from the first
29   cosinous window.

1   4.   (Original) The method according to Claim 3, further
2 comprising the step of reversing a selected one of the set of
3 samples before the step of combining the sets of samples.

1   5.   (Original) The method according to Claim 4, wherein the
2 step of reversing is performed only when two consecutive periods of
3 the synthesis waveform are formed using same periods of the
4 analysis waveform; and
5   wherein the step of reversing is responsive to a random number
6 generator.

1   6.   (Currently Amended) ~~The~~ A method of ~~Claim 2~~ synthesizing
2 music in a digital system, comprising the steps of:
3   accessing a digital analysis waveform having a first duration,
4 a first pitch, a first attack portion and a first decay portion,
5 said first attack portion corresponding to where said waveform
6 builds up to crescendo and then subsides;
7   determining a second duration and a second pitch for a
8 synthesis waveform;
9   computing first timing marks for the analysis waveform such
10 that the first timing marks correspond to periodicity of the
11 analysis waveform;
12   computing second timing marks for the synthesis waveform such
13 that the second timing marks correspond to periodicity of the
14 synthesis waveform;
15   calculating samples for each period of the synthesis waveform
16 defined by adjacent second timing marks using samples selected from

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17 a corresponding period of the analysis waveform defined by adjacent
18 first timing marks to form the synthesis waveform having the second
19 pitch, the second duration, a second attack portion and a second
20 decay portion; and
21   wherein the step of calculating samples forms the synthesis
22 waveform such that the second attack portion has a duration
23 approximately equal to a duration of the first attack portion.

    7 to 13.   (Canceled)

1   14.   (New) The method according to claim 1, wherein:
2   said step of synthesizing the second attack portion by pitch
3 modification of the analysis waveform if the duration of the
4 synthesis waveform is greater than the duration of the analysis
5 waveform and said step of synthesizing both the second attach
6 portion and the second decay portion by pitch modification if the
7 duration of the synthesis waveform is not greater than the duration
8 of the analysis waveform employs the equation:

9                          $Ia = Is * Ks1$

10 where: Ia is the analysis time mark index having a range from 0 to
11 Na-1; Is is the synthesis time mark index having a range from 0 to
12 Ns-1; and Ks1 is a fraction factor equal to Ts/Ta, where Ts is the
13 duration of the synthesis waveform and Ta is the duration of the
14 analysis waveform; and
15   said step of synthesizing the second decay portion if the
16 duration of the synthesis waveform is greater than the duration of
17 the analysis waveform employs the equation:

18                          $Ia = Is * Ks2$

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19 where: Ks2 is a fraction factor equal to (Ts*Da2)/(Ta*Ds2), where
20 Da2 is the duration of the decay portion of the analysis waveform
21 and Ds2 is the duration of the decay portion of the synthesis
22 waveform.